

**REMARKS**

To expedite prosecution and place the instant application in condition for allowance, Applicants have amended independent claims 1, 9, and 17 to more clearly set forth the inventive concept. Claims 6 and 14 have been canceled. Claims 1, 9, and 17 as amended herewith provide for a claim-designated peptide amphiphile compound that self-assembles to form a non-spherical micelle. Furthermore, the hydrophobic components, hydrophilic components, structural segments, and functional segments are more clearly identified in the amended claims. Support for these amendments are found throughout specification as originally filed, *inter alia*, at paragraphs [0030], [0031], and [0037]. No new matter is added by this amendment.

Upon the entry of the instant amendment, claims 1-5, 7-13, and 15-21 are pending in the application and claims 22-40 are withdrawn. Applicants respectfully request that the Examiner reconsider the outstanding rejections in light of the aforementioned amendments and the following remarks:

*Rejections under 35 USC 112, First Paragraph – Written Description Rejection*

Claims 1-21 are rejected under 35 USC 112, first paragraph, as allegedly failing to comply with the written description requirement. The Office Action states that the “hydrophobic component,” “hydrophilic component,” “formation of non-spherical micelle,” “structural peptide,” and “functional peptide” claim limitations are not supported by the written description.

Applicants have amended the claims. Claims 1 and 17 have been amended to better clarify the hydrophilic components. Therein, claims 1 and 17 now recite that the hydrophilic component is selected from the group consisting of CCCCCGGSS\*DS\*D, AAAAGGGSS\*DS\*D, SLSLGGGSS\*DS\*D, CCCCCGGS\*S\*DSD\*D, AAAAGGGS\*S\*DSD\*D, SLSLGGGS\*S\*DSD\*D, CCCCCGGDSS\*DS\*, AAAAGGGDSS\*DS\*, SLSLGGGDSS\*DS\*, CCCCCGGDS\*S\*DS\*,

AAAAGGGDS\*S\*DS\*, SLSLGGGDS\*S\*DS\*, CCCCGGGSDS\*DS\*,  
AAAAGGGSDS\*DS\*, SLSLGGGSDS\*DS\*, CCCCGGGS\*DS\*DS\*, AAAAGGG  
S\*DS\*DS\*, SLSLGGGS\*DS\*DS\*, CCCCGGGDS\*DS\*D, AAAAGGG DS\*DS\*D, and  
SLSLGGGDS\*DS\*D, wherein S\* is phosphorylated serine. Claim 9 has been amended  
to define the structural peptide as being one CCCC GGG, AAAAGGG, and SLSLGGG;  
and the functional peptide is defined as one of SS\*DS\*D, S\*S\*DSD\*D, DSS\*DS\*,  
DS\*S\*DS\*, SDS\*DS\*, S\*DS\*DS\*, and DS\*DS\*D, wherein S\* represents  
phosphorylated serine. Each of claims 1, 9 and 17 has been amended to define the  
hydrophobic component as a single alkyl group greater than six carbons in length.  
Applicants respectfully submit that the claims, as amended, are fully supported by the  
present specification. For example, Table 1 in paragraph 37 provides support for the  
hydrophilic components, structural segments, and functional segments in the amended  
claims. Moreover, support for the hydrophobic alkyl tail being greater than 6 carbon  
atoms is supported in paragraph 31. Applicants believe that the foregoing amendments  
obviate the written description rejection as the claims, as amended, are fully supported by  
the specification.

Withdrawal of the rejections is respectfully requested.

35 USC 112, First Paragraph – New Matter Rejection

The Office Action states that the language “non-spherical” to describe the micelle  
formed from the claim-designated peptide amphiphile compositions is not supported  
either literally or inherently by the specification and, as such, constitutes new matter.  
Applicants have amended the claim to remove the rejected language and identify the self-

assembled micelles as “cylindrical” in nature. Literal support for this language is found throughout the specification, for example, in paragraph [0042], wherein it is described that the “cylindrical micelles can be viewed as fibers in which the chemistry of the peptide region is repetitively displayed on their surface.” Therefore, Applicants respectfully submit that the new matter rejected has been obviated.

35 USC 112, Second Paragraph Rejections

Claims 9-21 were rejected under 35 USC 112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter, which Applicants regard as the invention.

The Office Action rejects the language “structural peptide,” “functional peptide,” and “overall conical shape”. Applicants have amended the claims to more clearly define the “structural peptide” and “functional peptide” as being one selected from the claim-defined Markush groups. As such, Applicants believe that there is no ambiguity as to these claim terms. Finally, Applicants have amended claim 9 to delete the language “overall conical shape” as it is believed that defining the peptides that may be used in the claim-designated definition of “structural peptide” and “functional peptide” is sufficient to define the claimed invention. Withdrawal of the rejections is requested.

35 USC 102(e) – Rejections

Claims 1, 3, 6, 7, 9, 11, 14-15, 17 and 19 are rejected as allegedly anticipated by Stupp et al., U.S. Patent No. 6,890,654. The rejection states that the ‘654 patent describes a peptide amphiphile composition comprising a hydrophobic component having

a single alkyl group, and a hydrophilic component covalently bonded to said hydrophobic component in said peptide amphiphile. It is stated that the peptide amphiphile self-assembles to form a cylindrical micelle. It is concluded that the '654 patent anticipates the claims.

Applicants have amended the claims to recite peptide amphiphiles that are not taught or suggested in the '654 patent. For example, claims 1 and 17 now recite that the hydrophilic component is selected from the group consisting of CCCCCGGSS\*DS\*D, AAAAGGGSS\*DS\*D, SLSLGGSS\*DS\*D, CCCCCGGS\*S\*DSD\*D, AAAAGGS\*S\*DSD\*D, SLSLGGGS\*S\*DSD\*D, CCCCCGGDSS\*DS\*, AAAAGGDSS\*DS\*, SLSLGGDSS\*DS\*, CCCCCGGDS\*S\*DS\*, AAAAGGDS\*S\*DS\*, SLSLGGDS\*S\*DS\*, CCCCCGGSDS\*DS\*, AAAAGGSDS\*DS\*, SLSLGGSDS\*DS\*, CCCCCGGS\*DS\*DS\*, AAAAGG S\*DS\*DS\*, SLSLGGGS\*DS\*DS\*, CCCCCGGDS\*DS\*D, AAAAGG DS\*DS\*D, and SLSLGGDS\*DS\*D, wherein S\* is phosphorylated serine. Moreover, claim 9 has been amended to define the structural peptide as being one of CCCCCGG, AAAAGG, and SLSLGG; and the functional peptide is defined as one of SS\*DS\*D, S\*S\*DSD\*D, DSS\*DS\*, DS\*S\*DS\*, SDS\*DS\*, S\*DS\*DS\*, and DS\*DS\*D, wherein S\* represents phosphorylated serine. Applicants submit that the peptide amphiphile compositions having the specified hydrophilic components and structural and functional peptide segments defined in the claims has not been taught or suggested by the '654 patent.

In view of the amendments made herein, Applicants respectfully request withdrawal of the instant rejection.

35 USC 102(b) - Rejections

Claims 1, 2, 9, 10, 14, 15, 17, and 18 are rejected under 35 USC 102(b) as allegedly being anticipated by Fields et al. The Action states that Fields teaches a peptide amphiphile composition comprising a hydrophobic component having a single alkyl group, and a hydrophilic component covalently bonded to said hydrophobic component. It is stated that the peptide amphiphile self-assembles to form a micelle.

Claims 1, 3, 4, 5, 7, 17, 19-21 are rejected under 35 USC 102(b) as allegedly being anticipated by Yamada et al. The Action states that Yamada teaches a peptide amphiphile composition comprising a hydrophobic component having a single alkyl group and a hydrophobic component covalently bonded to said hydrophobic component in the peptide amphiphile. It is stated that micelles are formed by the peptide amphiphiles in water.

Applicants respectfully traverse the rejection. Nevertheless, in order expedite prosecution and as described above in the response to the rejection under 35 USC 102(e), Applicants have amended the claims to further identify the structural peptides, functional peptides, and hydrophilic components that make up the peptide amphiphile compositions of the claimed invention. None of these peptide amphiphile compositions are taught or suggested by Fields et al or Yamada et al. In view of the foregoing claim amendments, Applicants request withdrawal of the instant rejections.

Double Patenting Rejections

Claims 1-5, 9-13, 17-19 are rejected on the ground of nonstatutory obviousness-type double patenting as allegedly being unpatentable over claims 7-9 of U.S. Patent No.

6,890,654. It is stated that the claims are not patentably distinct because the instant claims encompass the claimed composition of the '654 patent. Applicants respectfully traverse this rejection. Based on the instant amendments, Applicants contend that these claim sets are patentably distinct. The claims now more clearly define the peptide amphiphile compositions suitable for the invention. These peptide amphiphiles are nowhere taught or suggested by the '654 patent claims. Furthermore, the peptide amphiphiles of the instant invention have a suitable charge to allow for the biomineralization on biologically compatible implant surfaces. The peptide amphiphiles of the '654 patent claims do not express any necessity to have a specific charge for encapsulating nanotubes. Applicants respectfully request reconsideration of the instant rejection.

Claims 1-21 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over one or more claims of the following co-pending application: 10/368,517, 10/294,114, and 10/534,266. Applicants respectfully request that these rejections be held in abeyance until allowable claims of the instant application are indicated at which time Applicants will consider filing a terminal disclaimer.

#### Conclusion

In sum, Applicants respectfully submit that the amendments and remarks herein render moot the outstanding rejections set forth in the Office Action mailed May 2, 2007, and place the instant application in condition for immediate allowance. However, in the

event the Examiner believes a conference would expedite prosecution, she is courteously invited to contact the undersigned.

Respectfully submitted,

Date: 2 October 2007 \_\_\_\_\_

Benet Group  
c/o Intellevate  
P.O. Box 52050  
Minneapolis MN 55402  
Telephone: 202-253-7199  
Facsimile: 612-677-3572

By /Maria L. Macbius/ \_\_\_\_\_  
Maria L. Macbius  
Attorney for Applicant  
Registration No. 42,967

**CUSTOMER NUMBER 62249**